CHEMISTRY DIVISION
INDEXED

AMERICAN DYESTUFF REPORTER

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IN THIS ISSUE

The Philadelphia Textile Industry
Secretary of Internal Affairs Woodward Declares District Now a World Center

British "Rejection" of Licensing Methods
An Editorial

New Mineral Dyestuffs

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AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 7 New York, August 9, 1920 No. 6

PHILADELPHIA TEXTILE INDUSTRY

Secretary of Internal Affairs Woodward Declares District Now a World-Center

TEXTILES and allied products produced in Philadelphia County during the five years from the beginning of 1915 to December 31, 1919, had a value of $1,776,309,800, Secretary of Internal Affairs James F. Woodward told members of the Pennsylvania Manufacturers' Association at a noonday luncheon held at the Manufacturers' Club recently. Members of the association had invited Secretary Woodward to attend the luncheon and talk on the growth of the textile industry in Philadelphia.

Mr. Woodward declared that the pace struck now by the Philadelphia textile manufacturers and the manufacturers of allied products has placed Philadelphia among the top-notch textile centers of the world.

Pointing out that in 1915 the value of the products in Philadelphia was $214,145,000, Secretary Woodward said that the value in 1919 had more than doubled, going to $478,804,100. Speaking of wages paid employees in the textile industry, he declared that during the five-year period employees received approximately one dollar out of every six dollars' worth of finished products. The capital invested in the various textile industries of the county, as well as the value of production and wages paid, showed steady increases. In 1915 the industries represented a total capital of $115,957,000, while in 1919 the capital was $182,216,300.

Secretary Woodward, in explaining the work of his department at Harrisburg, declared that in his belief figures showing the greatness of industry in the State at large and in her many subdivisions are of extreme value and interest when fresh. He declared that prior to the entrance of the United States into the war, the inadequacy of the various industrial statistical bureaus of the Government and of the several States was discovered, and that in an effort to gather sufficient statistics to permit an intelligent location of industries necessary for the successful prosecution of the war, an expenditure of millions of dollars had to be made. Secretary Woodward said that it is his purpose to see to it that

an adequate inventory of Pennsylvania's resources is made annually and that the figures on the results of the study of industry will be given to the public as soon as compilations can be made. Heretofore, statistics of any division of the State or of any individual industry in the State were available only after a lapse of from eighteen months to two years or more. Under the present system in use in the Department of Internal Affairs, the collection of industrial reports is more rapid and hence the results of compilations are known in a much shorter time. This fact was shown by Secretary Woodward when he spoke of industrial figures in Philadelphia for the entire year of 1919 on a date less than six months after the close of the year.

Details of the growth of the textile industry in Philadelphia during the five years were left by Secretary Woodward to M. Hoke Gottschall, chief of the Bureau of Statistics and Information in the Department of Internal Affairs. It is the duty of Mr. Gottschall's bureau to secure the reports and make the compilations and because of his familiarity with the industrial census of the State, he was given the floor to talk on details.

The bureau chief explained that 41 different classes of industry have been placed under the general heading of "textiles and allied products" for compilation purposes. These industries, he said, in 1915 gave employment to 103,976 persons. In 1916 there were 92,110 employed while in 1917 the payrolls carried the names of 91,560. In 1918 the number employed was 83,454. The biggest percentage of decrease in the number of employees during those years, Mr. Gottschall said, was probably among the males, many of them leaving their places of employment to engage in work in the munitions plants or to join the army or the naval forces to fight down Kaiserism. In 1919, however, the first year of the reconstruction period and the relocation of persons in industry, the number of employees increased to 84,554. This increase was made entirely among m employees. It is interesting to n said Mr. Gottschall, that in 1915, w there were 103,976 employees, wages paid totaled $41,971,800 that in 1919, when there were 84, employed, the wages amounted to $ 863,100. Charts which were used Mr. Gottschall showed that in 1 the wages were $50,441,200; in 19 $57,228,900, and in 1918, $66,937,0

Of the total number of persons e ployed in the textile industries of Phi delphia County in 1919, 66,453 w Americans, 16,862 were foreigners a 1,239 were negroes. In 1915 th were 70,725 Americans, 32,848 forei ers and 403 negroes, showing that American and foreign working popu tions decreased during the period wh the negroes in textiles showed a l increase. Likewise there was big d crease in minor labor during the fi year period. In 1915, 1,412 males, u der the age of 16, were employed wh in 1919 the payrolls carried the nam of 1,147 minor males. In 1915 th were 2,569 minor females employ while in 1919 the number had d creased to 1,783.

A further survey of the employm figures shows that of all the pers employed in 1919, 37,698 were ma and 46,856 were females. In 19 there were 44,608 males and 59,3 females; in 1916 there were 40,8 males and 51,300 females; in 1917 th were 40,691 males and 50,869 fema and in 1918 there were 36,276 ma and 47,178 females.

Philadelphia County, according Mr. Gottschall's figures, had a total 1,189 industries engaged in the man facture of textiles and allied produc in 1915. There was a gradual decre in the number of these plants duri the five years, until in 1919 the to was 1,059. Despite this decrease in t number of establishments and the d crease in the number of employees, t value of production, as already point out, mounted steadily. During the p riod of the war numerous plants ov the State were forced to close becau

of the inability of manufacturers to procure sufficient labor and raw materials to carry on their business. This same condition was probably true in some instances in Philadelphia County, said Mr. Gottschall, and was probably attributable in a measure to the decrease in the number of textile and allied industries.

In the year 1915 the industries worked an average of 286 days while in 1919 the average was 277 days. In 1916 the average was 289 days; in 1917, 287 days, and in 1918, 286 days.

The totals for the five-year period as compiled by the Statistical Bureau in the Department of Internal Affairs show that yarn led with a value of $253,770,000. Next on the list, according to value, was hosiery and knit goods, worth $217,947,600. Woolen, worsted and felt goods were worth $184,064,000, while men's clothing had a value of $130,066,700. Women's and children's clothing in the five years had a value of $119,161,500, while carpets and rugs were worth $113,652,600. Then in their order came cotton goods worth $105,501,600; hats and caps, $73,417,500; silk, $57,268,800; shirts, $48,618,000; braids, etc., $45,888,400; shirt waists, $43,403,700; waste, $38,802,300, and a miscellaneous line of cordage and twine, underwear, blankets, spreads, skirts, towels, millinery, curtains, etc., $272,094,500.

During the year 1919 the value of yarn manufactured in Philadelphia was $76,210,000.

Cotton goods produced in the county in 1919 were worth $39,352,900, while braids, tapes and bindings had a value of $10,906,300. Carpets and rugs during the year had a market value of $30,890,300, and handkerchiefs, lace goods and embroideries were worth $8,681,400. Silk and silk goods valued at $12,978,300 were produced, and woolens, worsted and felt goods manufactured during the year had a selling value of $51,060,300. In 1919 men's clothing was worth $35,012,600 and women's and children's clothing had a value of $27,957,500. Hats and caps produced in 32 different plants were worth $18,745,300, and hosiery and knit goods were produced to the value of $61,187,000. Shirts worth $11,048,900, and shirt waists valued at $9,973,300 were also produced.

Despite the high cost of raw materials and the increased cost of operating which, of course, had a tendency to increase considerably the actual value of manufactured products, Philadelphia County made big gains in the textile industry in 1919, and the year stands out as a record breaker.

Under the laws of New Jersey, the Lorraine Chemical Corporation has been incorporated with a capital of $100,000 to manufacture chemicals of various kinds. Headquarters of the new enterprise will be located at Metuchen, that State, and the incorporators consist of William A. Smith, Sr., William A. Smith, Jr., and Philip T. Ruegger, all of Metuchen.

Amanil Colors for Cotton
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Amacid Colors for Dress Goods

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COLORIZATION

By Roberts Beaumont

Color, tone and quality, in a textile manufacture, are affected by (a) the physical structure and chemical composition of the fibrous material or materials selected, (b) the yarn construction, (c) the build or make of the fabric, and (d) the method or practice of finishing. These technicalities have each a specific and modifying influence on the behavior of the woven product in the dyeing process.

To consider, first, the filament properties. Each class of fiber, when dyed in the natural but "clean" and in the prepared or artificial state, exhibits a distinctive colorization value. Cotton assumes, in the tinting process, a comparatively dull, flat tone; wool, a full, soft, saturated hue; flax and rhea an intermediate quality between the cotton and the wool; alpaca, mohair or cashmere varying degrees of brightness, and silk a superlative color richness. Purity in the shade and evenness in the formation of the original fiber, of whatever species, are determinate factors as to the nature of the dyed color.

In view of these relative tinted values, producible in the use of the several groups of vegetable and animal fibers for manufacturing purposes, the problem of filament admixture is linked with that of the color quality obtainable in the dyed and finished fabric. Two pieces, one a solid and the second a union worsted, made of identical yarn counts and by identical methods in weaving, would develop different dyeing propensities.

Considering the yarn structure, this exercises a modifying effect on the colorization of the woven product. The system of intermingling, grouping, arranging and alignment of the fibers in the spinning processes, determines the type of thread acquired, whether smooth or rough in the structure, that is, receptive or otherwise, of the true-tinted value of the fibrous materials combined. The more level the thread the greater the degree of filament parallelization attained in its production, the smoother the surface and the bright the color resultant. And, similarly the rougher the yarn the more cross and varied in length the fibers of which it is composed and the softer and denser the dyed color.

The turns per inch in the yarn and the twine direction generated in spinning, being related to the thread structure, are also factors bearing on the colored aspect of the cloth. Increasing the amount of twist adds to the firmness and compactness of the yarn, as decreasing it in a given counts tends to produce a loose and pliable form of spun thread. In the dyed piece the quality of each yarn is evident in the color tone acquired. Arranging hard and soft spun threads in lines in the warp or weft and dyeing the cloth blue, brown or any ordinary shade, discloses the tinted qualities derivable from the degree of twine as distinct from the color tone originated by the class of filament used and the system of yarn preparation practised. As a general condition the firmer the twist the clearer the coloring and the looser the twist the mellower the tinted property of the fabric.

That fabric structure is capable of varying the color hue is evident on comparing, for example, textures of the rep or cord type with textures of a twilled construction composed of similar counts and grades of yarn, and dyed by the same procedure. The cloths correspond in shade but differ in tint, the twilled being distinctly more even and fresher in tone than the repped fabric. These color differentiations are purely a sequence of the orders of the warp and weft interlacings in the two textures. In one specimen —the rep or rib—the warp yarns appear on the surface, the weft being concealed, and the fabric is lined or ridged transversely. Under the microscope the reps resemble series of well-defined furrows. A woven surface of this description is exactly fitted for the expression of a broken and subdued tone of color. Regarding the twill, the two sets of yarns—warp and weft—in-

tersect equally, and construct an even, level cloth, adapted to the production of the normal color quality of the fiber and of the threaded structure, and, therefore, obtainable by any standard routine of dyeing.

Concerning finishing practice, it is complex in nature and in the manner in which it may be rendered efficient in emphasizing variations in color tinting. Inferences may be drawn from dyeing treatment and results in the "melton," "face," and ordinary types of finish applied to union fabrics. The first is a milled finish, developing a quantity of surface filament, moderated in density with the make of the cloth, the materials of which it consists, and the character of the weft yarn. This filament or "baulk" fiber causes the textural details, formed by the intercrossing of the warp and weft threads, to be almost invisible. Process dyeing on such a cloth has corresponding effects as to color tone as to the dyeing of a piece of carded and felted wool. Depth and quality of coloring ensue as the result of first felting one shot of weft with another and fiber with fiber; and, second, of raising the mass of fiber formed on to the face of the fabric, so that it projects in the form of short, close nap or pile, from the yarns in the cloth. Perfect evenness of shade is producible, but the original brightness of the wool, as observed when the filaments are lineally arranged, is absent. Finishing practice imparts to the color, developed in this grade of manufacture, depth and fullness of tone with a minimum degree of luster and freshness. On the other hand, the combing and dressing of the fibrous nap in the "face" or "doeskin" finish enhances the bright coloring property of the cloth, which may, if a union production, be of a like structure and felted condition as the melton. But raising action in this finish draws the fibers into a common

(*Continued on page* 12.)

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BRITISH "REJECTION" OF LICENSING METHODS

Persistent opposers of the Dye bill who triumphantly asserted that Great Britain had "rejected" the license scheme for the protection of her dye industry spoke too hastily. A bill has now been introduced into the House of Commons, especially designed to foster England's "key" industries, which lays particular stress on the synthetic dye industry. It is proposed to check the flow of foreign colors not manufactured by the British themselves by the application of a rigid system of licenses.

So far as this publication is aware, the very first mention of licensing in connection with a dye industry came from England. That was more than two years ago, at which time The REPORTER published in full the details of the proposed scheme and entered the first vigorous plea for the adoption of something similar in this country. Ever since that time we have kept persistently at it. Had anyone predicted that the end of the year 1920 would have been in sight before adequate protection of the American dye industry should have become a reality instead of a ghastly political battledore and shuttlecock, we should have been incredulous, to say the least. And so, we venture, would have most of the industry. But here we see the struggle going drearily on, with only the comforting assurance that there are to-day sufficient favoring votes in the Senate to pass the Dye bill just as soon as it can be voted upon. And in the meantime The REPORTER has not the slightest intention of abandoning its efforts or receding one whit from its stand. For the good of the entire country, American dye manufacturers and American dye consumers must receive full protection for their respective interests. Special legislation is necessary to accomplish this. Such legislation can be devised, and must be enacted.

The British considered the license system at some length, but did not adopt it in the original form proposed. Now they are about to make their brand of protection more stringent than ever. They have discovered that the British dye industry is suffering from a foreign competition which is seriously militating against its continued progress. The president of the British Board of Trade stated recently that the total quantity of synthetic dyestuffs, including a small quantity of intermediates, imported from Germany into Great Britain during the first six months of the present year was approximately 387 tons, which comprises 150 tons received under the reparation clauses of the Treaty of Versailles.

Non-British manufacturers of dyestuffs, particularly Americans, have felt the stiffening of the bars in British India, Hongkong, and in Australia. The "tight little Isle" itself is going to be tighter than ever in future where American and other foreign dyestuffs are concerned. You will not see Parliament consuming eighteen solid months trying to make up its mind to protect one of the "key" industries. Perhaps the approaching menace of the Red Armies, which draw ever nearer to Warsaw and ever nearer to German borders and ever nearer to an open break with England, have quickened that country's realization—slightly dulled after Germany was believed to have been removed as a menace—of the close relationship between the dye and the warfare industries. At all events, England's unwillingness to make full and effective use of a licensing sys-

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In these factories, which represent an investment of four billion dollars, over two million people are employed. They produce annually in manufactured goods nearly six billions of dollars or 25% of the country's total output of manufactured products.

American dyestuff manufacturers are straining every effort to keep these thousands of factories running, these millions of workers employed and the flow of manufactured products unbroken. For these efforts to be successful however, American manufacturers, American workers and American consumers must themselves provide the means of safeguarding this industry in such a way that its permanence, stability and continuous development is assured.

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tem for the protection of her dye industry will *not* constitute one of the arguments heard on the floor of the Senate next December.

The quantity of dyes imported into England from Germany does not end the record. The United States sold to England—not including her possessions—some $1,031,195 worth of synthetic and natural dyes during 1919. The British are beginning to realize that their dye makers have not kept pace with the American dye makers; that the latter got started first and have been able to maintain the lead for the simple reason that a head start in that industry is almost certain to make for a monopoly under any circumstances unless artificial measures are taken to prevent it. England never forgot that she must have a dye industry. She merely did not first choose strong enough methods. She will make no such mistake in future.

The question both in England and in this country is not at all connected with the eternal free trade *vs.* protection controversy, and those who have been spending their lives arguing over which theory is the better persist in dragging the dye industry into this perpetual struggle—where it does not belong—and in causing others to believe that free trade or protection are the only issues involved. As a matter of fact, neither one of these principles is even remotely involved. As long as we have a country we shall have protectionists and free traders, and sometimes one side will be in power and sometimes the other will be able to regulate matters to its own satisfaction. But neither considers that appropriations for and legislation favorable to education, sanitation or military defense has anything to do with the question of protection for this or that industry. Lack of the proper education is all that has prevented them from realizing that the dye industry is one with these.

COLONIZATION

(*Continued from page 9.*)

line, straightening and levelling them in the process, and also inducing that filament compactness and relation typical of the worsted yarn, with the fibers, however, raised from, and uniformly spread on, the textural surface. With the fibers thus laterally exposed to the light, in contrast to the ends of the fibers as in the melton fabric, the lustre value in the wool is enforced, and this imparts bloom and quality of hue to the dyed shades in face-finished clothes.

Primarily, the features in the development of dyed-mixture shades and in the methods of their application will be examined. It is understood that all such mixtures are a result of combining, in definite proportions, filament varieties; but the influence of yarn structure on the quality of the mixed shade produced remains to be particularized. Assuming the ingredients to be wool and cotton, a vigogne yarn is obtained by blending the materials in the carding operation, and a bi-fibered worsted yarn by blending the combed slivers in the processes of drawing. These differences, in detail of thread construction, have to be recognized as having an effect on the color tone of the dyed melange shade. All other

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technicalities being the same, the mixture tints in fabrics consisting of union combed yarns, are clearer in quality than in fabrics made of union carded yarns. This tinted distinctiveness, in the dyeing of these typical union thread structures, plainly arises from the greater uniformity of line observed, in the grouping of the fibers, in the worsted as compared with their arrangement and disposition in the woolen yarn. Thread formation is not, however, in such instances, an elemental but a subsidiary factor. It does not qualify the filament composition of the mixture shade, but needs to be taken into account as a modifier of the degree of color freshness attainable in yarn or piece dyeing. In this sense it corresponds with other technicalities in manufacture, as, for example, the build of the fabric, felting, raising and finishing work, which have been shown to exert a modifying influence on the attribution of textural toning.—*Union Textile Fabrication.*

GEORGE C. LOMMELL JOINS CAMPBELL

Announcement has been made to the effect that George C. Lommell, formerly chief chemist for the Dicks, David Company, has joined the staff of John Campbell & Co., whose headquarters are at 75 Hudson Street, New York City. Mr. Lommell's connection with the Campbell organization became effective August 1.

SACCHARINE DECLARED A HARMLESS CONDIMENT

British and U. S. Experts Scout Allegations That It Injures Health

There has appeared in the London *Daily Chronicle* and a number of other papers an article originating in Vienna dealing with saccharine and sugar, and their relative effects as dietetics. In view of the fact that saccharine is an important coal-tar product and that many possible consumers are confused as to its nature and innocuousness—some even being firmly convinced that danger attends its use—the following reply to this article of Sir Jesse Boot, which also appeared in the *Daily Chronicle,* ought to be of interest to readers of The REPORTER:

Sugar and saccharine, while both exhibiting the property of sweetness, belong really to entirely different categories in dietetics. Sugar is, properly used, a valued foodstuff. Saccharine is not, in any sense of the words, a foodstuff; it is a condiment, comparable in its uses to pepper, mustard, etc.

For more than thirty years my firm has been selling saccharine. During the war, at the urgent request of the Government, we started its manufacture on a large scale, and have since continued it. During all these years we have supplied many millions of people, and we are at present sending

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out millions of tablets weekly in addition to the saccharine manufactured for the home market and for export to all parts of the world.

Among the countless number of those who have used this article, we have never heard of one case of untoward results from its use. Used in the proper moderate quantity as a sweetener and not as a food, it is innocuous.

For a generation interested parties and governments (precisely as was the case with cane sugar when it was first introduced) have sought to prove that saccharine is inimical to health; in no authentic case has this been done.

On the contrary, a specially appointed commission of the highest experts in the U. S. A. whose food laws exceed in severity those of any other country has declared that there is no justification for the allegation that in the quantities used saccharine is, in the slightest, injurious to health.

Dye-a-Grams

A man may think—but unless his thoughts amount to something they won't mean anything.

—o—

Under a column headed "Obituary" a prominent contemporary publishes notice of the annual meeting of the American Dyes Institute.

—o—

. . . And also stated that the Institute would take some action on the Dye bill. The Dye bill may be given more "life" than the heading would intimate!

—o—

Prohibition was supposed to be better for business. The writer lives in a wet country where business is good, therefore cannot judge!

—o—

Shutting down mills and entertaining the employees seems like camouflaged philanthropy!

—o—

It's about time the feeling in Ireland was bottled up by "Cork."

No doubt textile operatives, now having the opportunity for a vacation, prefer to work!

—o—

Taking consideration of the persistent support given the industry by The Reporter, support by the industry of the new Technical Section would be in order.

—o—

Do the other fellow before he does you, is giving Scripture an awful twist! But it seems more popular.

—o—

We had a friend visit us from "Congress" Street, Boston, which will account for the lack of "punch" in the Dye-A-Grams this issue, the "punch" having been disposed of otherwise.

G. E. T.

COMPARATIVE RESULTS SHOWN ON NEW BACHMEIER COLOR CARD

A new Chrome Color Sample Card just issued be Bachmeier & Company, Inc., 438 West 3th Street, New York, N. Y., has been arranged so that a comparison of the results by the three chroming methods may be seen at a glance.

The dyeings are placed in three columns, Unichrome and Top Chrome dyeing methods are placed side by side and where any method is unsuitable for a color, it is so indicated in plain type.

Of special value to users of this class of colors is an appended chart showing the results of fastness and property tests of all the thirty-two colors shown.

The result is a card that fulfills every requirement of the trade and so simple in makeup as to be easily understood.

Unichrome is a name adopted by Bachmeier & Company, Inc., to designate the process in which mordanting and dyeing is done at the same time, and is used to avoid confliction with names used by other concerns.

NEW MINERAL DYESTUFFS

M. Malcolmson and F. W. V. Fitzgerald have taken out a patent for the manufacture of new dyestuffs and for new processes. Certain salts of metals are capable of reacting with other salts of minerals or metals to fix various shades on wool. When certain of these colors do not dye cotton the addition of sulphur enables various shades of color to be produced and fixed on the vegetable fiber.

The inventor, naturally, does not assert that he has discovered that mineral and metallic substances are of use in the production or fixing of colors, but claims to have invented a method of treating certain substances of mineral or metallic origin in a novel manner, whereby the use of these substances for dyeing may be greatly extended and more economical.

To obtain light, medium, and deep shades of brown to black on woolen yarn or fabric, at temperatures varying from 60 deg. to 180 deg. Fahr., a lead compound, such as lead oxide, carbonate, nitrate, acetate or sulphate of lead, is used in the proportion of from 2 per cent upwards of the weight of material to be dyed. After stirring this into the dye beck, a small proportion of caustic soda is added, from 1 per cent upwards, calculated upon the weight of the goods to be dyed.

When the caustic soda has dissolved the yarn or fabric is entered. If oxide or carbonate of lead has been used, the color will gradually develop after a few hours in the cold. By heating the dye beck to a temperature from 100 deg. to 180 deg. Fahr. (care being taken not to tender the goods by too high a temperature) the color can be developed in from twenty to thirty minutes.

If too deep a color is obtained, this may be rectified by passing the goods through a dilute sulphuric acid bath or by the addition of sulphuric acid to the dye beck. Nitric acid may be used in the place of sulphuric acid if a brighter yellowish color is desired. The addition of salt to the dye beck retards the development of the color.

Calcium hydrate may be used in the place of the hydrate of soda if desired. Since, however, this is converted into carbonate in the process of dyeing, caustic soda is preferred because the carbonate is soluble, whereas calcium carbonate is insoluble, and further, the insoluble carbonate becomes entangled or embedded in the fiber. However, the formation of an insoluble carbonate, when calcium hydrate is added direct to the dye beck, can be prevented by the use of a small quantity of sal ammoniac. This effects the formation of ammoniate carbonate, which is volatile, and of soluble calcium chloride in the place of the insoluble carbonate.

The insoluble lead compounds can be mechanically mixed with sodium carbonate and calcium oxide, in various proportions, this mixture yielding a dyestuff capable of giving a good direct brown to woolen when used alone. Three parts of an insoluble lead compound, such as litharge, mixed with four parts of calcium oxide and six

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parts of sodium carbonate (the whole being thoroughly ground down and mixed together) makes a good mixture. From 1 per cent upwards of this mixture, calculated upon the quantity of wool to be dyed, may be used to give a brown to woolen.

Good results have been obtained by adding various quantities of this mixture to the bath, at from 100 deg. to 120 deg. Fahr., entering the goods to be dyed at 180 deg. to 212 deg. Fahr., dyeing taking from thirty minutes upwards, according to shade.

In manufacturing a dyestuff from these lead compounds, a saturated solution of a soluble lead salt is combined with a soluble salt of iron or copper which contains water of crystallization by first rendering the iron or copper salt anhydrous, and then replacing the water of crystallization by the saturated lead solution. Soluble vegetable or organic coloring matters may be added to this lead soluble and dissolved in it prior to its being combined with the anhydrous iron or copper salt. The quantity of iron or copper salt to be used will, of course, be calculated from the known quantity of water of crystallization originally containe in a given quantity of the iron or copper salt. The water of crystallization must be equal to, or greater than, the water contained in the lead solution.

The combination of the lead solution with a copper salt yields a dyestuff capable of impairing a good direct khaki to woolen, when used in conjunction with an alkaline mordant. The combination of an iron salt with the lead solution yields a brown.

When using the combination of a solution of a soluble lead salt with the anhydrous copper sulphate or salt previously described, a mordant is used, composed of a ground down mixture of sodium carbonate and calcium oxide. Six parts of sodium carbonate and four parts of calcium make a good mixture, but other proportions may be used. Dyestuff and mordant may be used in equal proportions, the combined quantities being regulated according to the depth of shade.

In dyeing with these substances the required quantity of dyestuff is entered into the dye bath at from 90 deg. to 120 deg. Fahr. When the dyestuff has dissolved the goods are entered and the temperature of the dye liquor raised to 212 deg. Fahr. While the dye liquor is coming to the boil the required quantity of mordant is put in with a enameled iron vessel with from twelve times upward by bulk of cold water, and the liquid is brought to the boil. After the sediment has settled, and when the dye bath has been raised to 212 deg. Fahr., the goods are lifted and the clear mordant liquor is put into the dye water. If necessary, a strainer is used to prevent any of the sediment passing into the dye bath.

It will be obvious that an extensive variety of shades may be produced by mixing the various substances or by successively dyeing the same fabric with two or more of the colors. The production of certain of these shades, however, necessitates the use of an acidified solution of the metallic salt.

For tissue printing various resists or alterants may be topically applied prior to the dyeing of the fabric in order to produce various effects.

As an instance of the use of sulphur when the color goes on wool but not upon cotton, sulphur is added to the extent of from one-quarter to one-half of the weight of the lead compound used before mixing in the caustic calcium or sodium hydrate. After entering the cotton goods, the dye bath is brought to 212 deg. Fahr., at which temperature the color rapidly takes upon the cotton.

The inventor is of the opinion that with certain exceptions, these colors result from the formation of wholly or moderately insoluble metallic sulphides within or upon the yarn or fabric to be dyed. In this connection it may be stated that the inventor has found that the use of a metallic sulphate, or the addition of sulphur to the dyestuff,

tends to intensify or deepen the shades produced upon the wool.

It is not only the alkaline reactions or the formations of alkaline or neutral sulphurets that produce certain shades, but certain metals—copper, for instance—have their sulphides precipitated by the evolution within, or the passing of sulphureted hydrogen through an acidified solution of their salts. Fibers which do not contain sulphur in themselves should be treated in the manner indicated for cotton.—*Possell's Textile Journal.*

DYEING AND PRINTING WITH TANNIN DYESTUFFS

This process, the work of Nicolas Wosnessensky, of Moscow-Priesnia, forms the subject of German patent 308,815. The application of the one-bath method in dyeing is well known, and has been described in the previous patents 95,718 and 120,316. By the present method, however, the tannin and the dyestuff are not applied at the same time, but the one after the other. Moreover, the earlier process (German patent 120,316) is serviceable only for the production of pale and medium shades. According to this, the material, fabric or yarn, is padded with a solution or mixture containing the coloring matter, tannin, and a phenol, especially resorcin, as the solvent. The use of resorcin in dyeing in this way does not constitute a novelty as was set forth in the "Bulletin of the Soc. Ind. de Mulhouse," of 1901. Resorcin has, however, only been used till now for the fixation of coloring matters, and in that form of application has not given satisfactory results. The application was not previously known of resorcin for effecting the solution of the compound of the coloring matter with tannin, nor of the compound of tannin, coloring matter, and antimony salt. This particular application of resorcin constitutes the novelty of the present invention. To effect the solution (only of the two components, dyestuff and tannin), other alcohols may be employed. But without resorcin the resulting colors are less fast, because the phenol becomes vaporized during the drying operation, and proper association of the color with the fiber thereby hindered. The problem is the production of colors, fast to rubbing, by the use of the tannin dyestuffs, which up to now has not been solved. A prize has been offered for the solution of this problem by the Society of Dyers and Colorists.

The use of tannin together with the dyestuff is also known in calico printing, but the application of these two components together with antimony salts was not known, and for such a method a prize was offered by the Societe Ind. de Mulhouse. Example I: The goods are padded with a mixture composed of Methylene blue, from 5 to 40 parts; resorcin, from 25 to 50 parts; tannin, from 10 to 80 parts; acetic acid, from 50 to 200 parts; water, war, 640 parts. The goods are eventually steamed, passed through a solution oi antimony salt, and washed. Example II: The goods are printed with a paste

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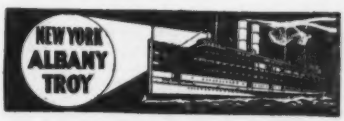

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made up of Methylene blue, from 5 to 30 parts; resorcin, from 25 to 100 parts; tartaric acid, from 20 to 40 parts; tannin, from 15 to 100 parts; acetic acid, 100 parts; tartar emetic, from 5 to 20 parts; water and gum-tragacanth thickening, 620 parts. After printing, the material is steamed and washed.—*Textile Colorist.*

NOTES OF THE TRADE

Under the laws of New York, the M. Ames Chemical Works have been incorporated with a capital of $100,000. Headquarters will be at Glens Falls, and the incorporators are L. A. Baldwin and W. H. and C. B. Barber.

The Biscayne Chemical Company has been incorporated under the laws of Florida with a capital of $50,000. Headquarters of the new enterprise will be located at Jacksonville, that State. E. L. Carter is president of the company and R. L. Eubanks is secretary and treasurer.

The plant of the Dominion Tar & Chemical Company, Sydney, Nova Scotia, has been tied up for a fortnight owing to damage caused by a fire which resulted when some hot pitch ignited woodwork.

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The Ault & Wiborg Company, Cincinnati, has purchased the plant and other interests of the Queen City Varnish Company, Dana Street and Montgomery Road, Evanston, just outside of Cincinnati. This plant is said to be one of the largest and most modern in the country.

Announcement has been made by the Croton Color & Chemical Company to the effect that it has recently completed an addition to the main building of its plant at Croton, N. Y. The company has also purchased an additional tract of land to provide for future expansion.

Announcement has been made to the effect that Innis, Speiden & Co., New York, have acquired the property at 722-732 West Austin Avenue, Chicago. The Chicago offices and warehouses of the company will be removed to this address after extensive alterations and improvements have been completed.

The Morgan-Roche Chemical Machine Corporation has been organized at New Brunswick, N. J., with a capital of $100,000. The incorporators consist of Thomas A. Roche and William Morgan, of South River, and E. F. Couch, of New Brunswick.

To manufacture cotton and woolen goods, the White Manufacturing Company has been incorporated under the laws of Vermont. Headquarters of the company will be located at Brattleboro, and the capital is $50,000. The incorporators consist of F. E. Clark, H. L. Emerson, J. K. Harvey and Harold E. Whitney, all of Brattleboro.

The Jacques Wolf Chemical Company, Clifton, N. J., has awarded a contract to L. Swenson, 631 Main Street, Passaic, N. J., for the erection of a new two-story plant at Passaic. The new structure will cost in the neighborhood of $60,000.

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